

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

97 **Claims 1** (currently amended): A phosphor blend comprising at least two phosphors selected from the group consisting of (a) $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}, \text{Mn}^{2+}$; (b) $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH}):\text{Eu}^{2+}, \text{Mn}^{2+}$ wherein a is in a range from about 4.5 to and including 5; (c) $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2:\text{Mn}^{4+}$; (d) $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$; ~~(e)~~ $(\text{Sr}, \text{Ba}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{OH}):\text{Eu}^{2+}$; ~~(f)~~ (e) an europium-activated aluminate phosphor selected from the group consisting of $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$, $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$, and $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$; and ~~(g)~~ (f) an europium and manganese co-activated aluminate phosphor selected from the group consisting of $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}, \text{Mn}^{2+}$, $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}, \text{Mn}^{2+}$, and $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}, \text{Mn}^{2+}$; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

Claim 2 (currently amended): The phosphor blend of claim 1, wherein said phosphor blend preferably absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

Claim 3 (currently amended): The phosphor blend of claim 1, wherein a is preferably in a range from about 4.7 to and including 5, ~~and more preferably from about 4.9 to and including 5.~~

Claim 4 (original): The phosphor blend of claim 1, wherein said emitted light is white light.

Claim 5 (original): The phosphor blend of claim 4, wherein said white light has color coordinates substantially on a black body locus of a CIE chromaticity diagram.

113
Claim 6 (currently amended): A phosphor blend comprising a mixture of $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}, \text{Mn}^{2+}$ and at least one phosphor that is selected from the group consisting of (a)

(Ca,Sr,Ba)_a(PO₄)₃(F,Cl,OH):Eu²⁺,Mn²⁺ wherein a is in a range from about 4.5 to and including 5 ; (b) 3.5MgO·0.5MgF₂·GeO₂:Mn⁴⁺; (c) Sr₄Al₁₄O₂₅:Eu²⁺; ~~(d)~~ (Sr,Ba,Ca)₅(PO₄)₃(Cl,OH):Eu²⁺; ~~(e)~~ (d) an europium activated aluminate phosphor selected from the group consisting of (Ba,Ca,Sr)₂MgAl₁₆O₂₇:Eu²⁺, (Ba,Ca,Sr)MgAl₁₀O₁₇:Eu²⁺, and (Ba,Ca,Sr)Mg₃Al₁₄O₂₅:Eu²⁺; and ~~(f)~~ (e) an europium and manganese co-activated aluminate phosphor selected from the group consisting of (Ba,Ca,Sr)₂MgAl₁₆O₂₇:Eu²⁺,Mn²⁺, (Ba,Ca,Sr)MgAl₁₀O₁₇:Eu²⁺,Mn²⁺, and (Ba,Ca,Sr)Mg₃Al₁₄O₂₅:Eu²⁺,Mn²⁺; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

9- **Claim 7** (currently amended): The phosphor blend of claim 6, wherein said phosphor blend preferably absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

Claim 8 (currently amended): The phosphor blend of claim 5, wherein a is preferably in a range from about 4.7 to and including 5, ~~and more preferably from about 4.9 to and including 5.~~

Claim 9 (currently amended): A phosphor blend comprising a mixture of (Ca,Sr,Ba)_a(PO₄)₃(F,Cl,OH):Eu²⁺,Mn²⁺ wherein a is in a range from about 4.5 to and including 5 and at least one phosphor that is selected from the group consisting of (a) Sr₂P₂O₇:Eu²⁺,Mn²⁺; (b) 3.5MgO·0.5MgF₂·GeO₂:Mn⁴⁺; (c) Sr₄Al₁₄O₂₅:Eu²⁺; (d) (Sr,Ba,Ca)₅(PO₄)₃(Cl,OH):Eu²⁺; (e) an europium activated aluminate phosphor selected from the group consisting of (Ba,Ca,Sr)₂MgAl₁₆O₂₇:Eu²⁺, (Ba,Ca,Sr)MgAl₁₀O₁₇:Eu²⁺, and (Ba,Ca,Sr)Mg₃Al₁₄O₂₅:Eu²⁺; and (f) an europium and manganese co-activated aluminate phosphor selected from the group consisting of (Ba,Ca,Sr)₂MgAl₁₆O₂₇:Eu²⁺,Mn²⁺, (Ba,Ca,Sr)MgAl₁₀O₁₇:Eu²⁺,Mn²⁺, and (Ba,Ca,Sr)Mg₃Al₁₄O₂₅:Eu²⁺,Mn²⁺; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

Claim 10 (currently amended): The phosphor blend of claim 9, wherein said phosphor blend ~~preferably~~ absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

Claim 11 (currently amended): The phosphor blend of claim 9, wherein a is ~~preferably~~ in a range from about 4.7 to and including 5, ~~and more preferably from about 4.9 to and including 5.~~

Claim 12 (currently amended): A phosphor blend comprising a mixture of $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}, \text{Mn}^{2+}$ and $(\text{Ca}, \text{Sr}, \text{Ba})_5(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH}):\text{Eu}^{2+}, \text{Mn}^{2+}$; wherein a is in a range from about 4.5 to and including 5, and said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

Claim 13 (currently amended): The phosphor blend of claim 12, wherein said phosphor blend ~~preferably~~ absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

Claim 14 (currently amended): The phosphor blend of claim 12, wherein a is ~~preferably~~ in a range from about 4.7 to and including 5, ~~and more preferably from about 4.9 to and including 5.~~

Claim 15 (currently amended): A phosphor blend comprising a mixture of phosphors having formulas $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2:\text{Mn}^{4+}$; $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$; and an europium and manganese co-invented aluminate phosphors selected from the group consisting of $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}, \text{Mn}^{2+}$, $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}, \text{Mn}^{2+}$, $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}, \text{Mn}^{2+}$; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

Claim 16 (currently amended): The phosphor blend of claim 15, wherein said phosphor blend ~~preferably~~ absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

Claims 17-18 (canceled)

Claim 19 (currently amended): A phosphor blend comprising a mixture of phosphors having a formula of $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2 \cdot \text{Mn}^{4+}$; $(\text{Sr}, \text{Ba}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{OH}) \cdot \text{Eu}^{2+}$; and an europium and manganese co-activated aluminate phosphor selected from the group consisting of $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27} \cdot \text{Eu}^{2+}$, $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17} \cdot \text{Eu}^{2+}$, Mn^{2+} , and $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25} \cdot \text{Eu}^{2+}, \text{Mn}^{2+}$; said phosphor blend being capable of absorbing electromagnetic radiation having wavelengths in a range from about 315 nm to about 480 nm and emitting light having wavelengths in the visible spectrum.

Claim 20 (currently amended): The phosphor blend of claim 19, wherein said phosphor blend preferably absorbs electromagnetic radiation substantially in a wavelength range from about 350 nm to about 410 nm.

Claim 21 (currently amended): A light source comprising: at least one LED that is capable of emitting electromagnetic radiation having wavelengths in a range from near UV to blue; least one phosphor material selected from the group consisting of (a) $\text{Sr}_2\text{P}_2\text{O}_7 \cdot \text{Eu}^{2+}, \text{Mn}^{2+}$; (b) $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH}) \cdot \text{Eu}^{2+}, \text{Mn}^{2+}$ wherein a is in a range from about 4.5 to and including 5; (c) $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2 \cdot \text{Mn}^{4+}$; (d) $\text{Sr}_4\text{Al}_{14}\text{O}_{25} \cdot \text{Eu}^{2+}$; (e) $(\text{Sr}, \text{Ba}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{OH}) \cdot \text{Eu}^{2+}$; (f) an europium-activated aluminate phosphor selected from the group consisting of $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27} \cdot \text{Eu}^{2+}$, $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17} \cdot \text{Eu}^{2+}$, and $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25} \cdot \text{Eu}^{2+}$; and (g) an europium and manganese co-activated aluminate phosphor selected from the group consisting of $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27} \cdot \text{Eu}^{2+}, \text{Mn}^{2+}$, $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17} \cdot \text{Eu}^{2+}, \text{Mn}^{2+}$, and $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25} \cdot \text{Eu}^{2+}, \text{Mn}^{2+}$; and (h) mixtures thereof; said phosphor material being capable of absorbing said electromagnetic radiation emitted by said LED and emitting light having wavelengths in the visible spectrum.

Claim 22 (original): The light source of claim 21, wherein said LED emits electromagnetic radiation in a wavelength from about 315 nm to about 480 nm.

Claim 23 (currently amended): The light source of claim 21, wherein a is preferably from about 4.7 to and including 5, and more preferably from about 4.9 to and including 5.

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Claim 24 (currently amended): The light source of claim ~~17~~ ¹⁵, wherein said LED preferably emits electromagnetic radiation from about 350 nm to about 410 nm.

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Claim 25 (currently amended): A light source comprising: at least one LED that is capable of emitting electromagnetic radiation having wavelengths in a range from near UV to blue; and a phosphor consisting of a material selected from the group consisting of $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}$, Mn^{2+} , $(\text{Ca},\text{Sr},\text{Ba})_a(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH})\text{Eu}^{2+}$, Mn^{2+} wherein a is in a range from about 4.5 to and including 5, and mixtures thereof; said phosphor being capable of absorbing said electromagnetic radiation emitted by said LED and emitting light having wavelengths in the visible spectrum.

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Claim 26 (currently amended): The light source of claim ~~25~~ ²⁵ wherein a is ~~preferably~~ from about 4.7 to and including 5, ~~and more preferably from about 4.9 to and including 5.~~

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Claim 27 (currently amended): ~~The~~ A light source ~~according to claim 20~~ comprising: at least one LED that is capable of emitting electromagnetic radiation having wavelengths in a range from near UV to blue; and a phosphor consisting of a first material selected from the group consisting of $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}$, Mn^{2+} and $(\text{Ca},\text{Sr},\text{Ba})_a(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH})\text{Eu}^{2+}$, Mn^{2+} wherein a is in a range from about 4.5 to and including 5; and a second, wherein said phosphor material further comprises a phosphor selected from the group consisting of (a) $3.5\text{MgO} \cdot 0.5\text{MgF}_2\text{GeO}_2:\text{Mn}^{4+}$; (b) $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$; (c) an europium-activated aluminate phosphor selected from the group consisting of $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$, Mn^{2+} , $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$, Mn^{2+} , and $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$, Mn^{2+} ; and (d) (c) an europium and manganese co-activated aluminate phosphor selected from the group consisting of $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$, Mn^{2+} , $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$, Mn^{2+} , and $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$, Mn^{2+} .

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Claim 28 (new): The phosphor blend of claim 1, wherein a is in a range from about 4.9 to and including 5.

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Claim 29 (new): The phosphor blend of claim 5, wherein a is in a range from about 4.9 to and including 5.

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Claim 30 (new): The phosphor blend of claim 9, wherein a is in a range from about 4.9 to and including 5.

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15
Claim ~~31~~ (new): The phosphor blend of claim ~~12~~, wherein a is in a range from about 4.9 to and including 5.

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Claim ~~32~~ (new): The light source of claim 21, wherein a is from about 4.9 to and including 5.

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Claim ~~33~~ (new): The light source of claim ~~25~~, wherein a is from about 4.9 to and including 5.
